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Specification

Fluid Storing Container

[CLAIMS]

1. A fluid storing container possessing an external container on top of which an opening portion is formed, an internal container which comprises a flexible bag body having an opening portion and which can be housed inside said external container, a nearly cylinder-shaped coupling material set up in the opening portion of said internal container, which enables a fluid stored inside said internal container to be discharged outside via the opening portion of said external container and forms an internal space shielded from the outside between said internal container and said external container by fixing the opening portion of said internal container in the vicinity of the opening portion of said external container, and a fluid discharge pump for discharging the fluid stored inside said internal container from a nozzle head set up over said external container by pressing said nozzle head, wherein said coupling material is characterized in that possessing a runoff prevention mechanism preventing the fluid from flowing out from said internal space to the outside as well as enabling the air to flow into said internal space from the outside.
2. The fluid storing container as claimed in Claim 1, wherein said fluid discharge pump is set up inside said nearly cylinder-shaped coupling material.
3. A fluid storing container possessing an external container on top of which an opening portion is formed, an internal container which comprises a flexible bag body having an opening portion and which can be housed inside said external container, a nearly cylinder-shaped coupling material set up in the opening portion of said internal container, which enables a fluid stored inside said internal container to be discharged outside via the opening portion of said external container and forms

an internal space shielded from the outside between said internal container and said external container by fixing the opening portion of said internal container in the vicinity of the opening portion of said external container, and a valve mechanism for discharging the fluid stored inside said internal container from an upper portion of said external container by applying pressure to the fluid stored inside said internal container, wherein said coupling material is characterized in that possessing a runoff prevention mechanism preventing the fluid from flowing out from said internal space to the outside as well as enabling the air to flow into said internal space from the outside.

4. The fluid storing container as claimed in Claim 3, wherein said valve mechanism is set up inside said nearly cylinder-shaped coupling material.
5. The fluid storing container as claimed in any one of Claims 1 to 4, which possesses flexible leakproof portions which have an umbrella shape opening out toward an internal direction of the external container and whose maximum outer diameter portions contact the opening portion in the external container.
6. The fluid storing container as claimed in Claim 5, wherein the runoff prevention mechanism possesses a through-bore passing through between the outside and said internal space, which is formed in said coupling material, and a through-bore closing material closing said through-bore, which is set up outside said coupling material.

[Detailed Description of the Invention]

[0001]

[Technical Field]

The present invention relates to a fluid storing container possessing an external container and an internal container and storing a fluid.

[0002]

[Prior Art]

As such fluid storing containers, as described in Patent Literature 1, a fluid storing container, in which an internal container incorporated in an external container, inside which the internal container a fluid can be filled and is made of a material which

changes shape inward as inside the internal container is depressurized and in whose opening portion a fluid discharge pump is installed, has been known. The opening portion of the internal container and the fluid discharge pump in this fluid storing container are installed to airproof inside the internal container. Additionally, a space shielded from the outside by a lid is formed between the external container and the internal container. An air hole is provided in the external container, preventing pressure inside the space from decreasing by decrease in the volume of the internal container. This enables sucking in the fluid stored regardless of the remaining amount of the fluid stored, while maintaining an outer shape of the container main body.

[0003]

[Patent Literature 1] Japanese Patent Laid-open No.2001-335087

[0004]

[Problems that the Invention Intends to Solve]

This fluid storing container, however, has problems: When the fluid stored leaks into the space formed between the external container and the internal container due to damage made to the internal container, etc., the fluid leaking into the space leaks outside the external container through the air hole provided in the external container. Additionally, it is difficult to use containers available on the market as the external containers as they are, because providing the air hole in the external containers is necessary.

[0005]

The present invention was achieved to solve the above-mentioned problems. The object of the present invention is to provide a fluid storing container which can prevent a stored fluid leaking into a space formed between the container main body and the internal container from flowing outside the container main body and for whose external container, containers available on the market can be used.

[0006]

[Means to solve the problems]

The invention described in Claim 1 possesses an external container on top of which an opening portion is formed, an internal container which comprises a flexible bag body having an opening portion and which can be housed inside the external container, a

nearly cylinder-shaped coupling material set up in the opening portion of the internal container, which enables a stored fluid inside the internal container to be discharged outside via the opening portion of the external container and forms an internal space shielded from the outside between the internal container and the external container by fixing the opening portion of the internal container in the vicinity of the opening portion of the external container, and a fluid discharge pump for discharging the fluid stored inside the internal container from a nozzle head set up over the external container by pressing the nozzle head. The coupling material is characterized in that possessing a runoff prevention mechanism preventing the fluid from flowing out from the internal space to the outside as well as enabling the air to flow into the internal space from the outside.

[0007]

The invention described in Claim 2 is that in the fluid storing container described in Claim 1, the fluid discharge pump is set up inside the nearly cylinder-shaped coupling material.

[0008]

The invention described in Claim 3 possesses an external container on top of which an opening portion is formed, an internal container which comprises a flexible bag body having an opening portion and which can be housed inside the external container, a nearly cylinder-shaped coupling material set up in the opening portion of the internal container, which enables a stored fluid inside the internal container to be discharged outside via the opening portion of the external container and forms an internal space shielded from the outside between the internal container and the external container by fixing the opening portion of the internal container in the vicinity of the opening portion of the external container, and a valve mechanism for discharging the fluid stored inside the internal container from an upper portion of said external container by applying pressure to the fluid stored inside the internal container. The coupling material is characterized in that possessing a runoff prevention mechanism preventing the fluid from flowing out from the internal space to the outside as well as enabling the air to flow into the internal space from the outside.

[0009]

The invention described in Claim 4 is that in the fluid storing container described in Claim 3, the valve mechanism is set up inside the nearly cylinder-shaped coupling material.

[0010]

The invention as described in Claim 5 is that in the fluid storing container described in any one of Claims 1 to 4, the runoff prevention mechanism possesses the leakproof portions which have an umbrella shape opening out toward an internal direction of the external container and whose maximum outer diameter portions contact the opening portion of the external container.

[0011]

The invention described in Claim 6 is that in the fluid storing container described in Claim 5, a through-bore passing through between the outside and the internal space is formed in the coupling material and a through-bore closing material closing the through-bore is further set up outside the coupling material.

[0012]

[Best Modes for Carrying out the Invention]

The present invention is described in detail with referent to the drawings. Fig. 1 is a cross section of the relevant part of the first embodiment of the fluid storing container according to the present invention. Fig. 2 is a cross section showing an exploded view of the relevant part of the first embodiment of the fluid storing container according to the present invention. In Fig. 1 and Fig. 2, hatching is added only to cross sections of the coupling material 140, the through-bore closing material 143 and the fluid. Additionally, a front view of a nozzle head 2 and an outer lid 3 is shown in Fig. 1 and Fig. 2.

[0013]

The fluid storing container is used as a container for beauty products for storing gels such as hair gels and cleansing gels or creams such as nourishing creams and cold creams used in the cosmetic field. Additionally, this fluid storing container can also be used as a container for medicines, solvents or foods, etc. In this specification, high-

viscosity liquids, semifluids, or gels that sol solidifies to a jelly, creams and regular liquids are all referred to as fluids.

[0014]

This fluid storing container comprises a fluid discharge pump 1, the nozzle head 2, the outer lid 3 and the fluid storing portion 4 storing a fluid inside it.

[0015]

As shown in Fig. 1, a suction tube 90 has a construction of being inserted into the fluid storing portion 4. As shown in Fig. 2, the fluid discharge pump 1, the nozzle head 2, the outer lid 3 and the fluid storing portion can be detached from each other.

[0016]

Figures 3 to 6 are longitudinal sections showing the first embodiment of the fluid storing container according to the present invention. Hatching is added only to cross sections of the coupling material 140, the through-bore closing material 143, the first and the second coupling tubes 81 & 82, a cylinder 23, and the fluid. Of these figures, Fig. 3 shows a position in which the fluid discharge pump is left as it is without stress applied. Fig. 4 shows a position in which the first and the second coupling tubes 81 & 82 are descending along with the piston 83 with a pressing portion 12 of the nozzle head 2 being pressed. Fig. 5 shows a position in which both the first and the second coupling tubes 81 & 82 have reached the bottom along with the piston 83. Fig. 6 shows a position in which the first and the second coupling tubes 81 & 82 are ascending along with the piston 83 with pressure applied to the nozzle head 2 removed.

[0017]

As shown in Fig. 3, the nozzle head 2 has a discharge portion 11 for discharging the fluid and the pressing portion 12 which is pressed when the fluid is discharged. The outer lid 3 is engaged with a screw portion formed at the top of the fluid storing portion 4 via a screw material.

[0018]

In this fluid storing container, by reciprocating the piston in upward and downward directions by pressing the pressing portion 12 in the nozzle head 2, the fluid stored inside the fluid storing portion 4 is discharged from the discharge portion 11 in the

nozzle head 2 by the action of the fluid discharge pump 1 described in detail later. Additionally, in this specification, the upward and downward directions shown in Fig. 1 to Fig. 2 are defined as the upward and downward directions in the fluid storing container.

[0019]

The fluid storing portion 4 of the fluid storing container according to the present invention is described below. Fig. 7 is a longitudinal section showing a position in which the fluid storing portion 4 of the fluid storing container according to the present invention is assembled. Fig. 8 is a longitudinal section showing a position of the fluid storing portion 4 of the fluid storing container according to the present invention with the fluid filled. Hatching is added only to cross sections of the coupling material 140, the through-bore closing material 143, and the fluid in Fig. 7 and Fig. 8.

[0020]

The fluid storing portion 4 possesses an external container 110 on top of which an opening portion is formed, an internal container 120 which can be housed inside the external container 110, and a coupling material 140 set up in the opening portion 121 of the internal container, which forms an internal space 130 shielded from the outside between the internal container 120 and the external container 110 by fixing the opening portion 121 of the internal container in the vicinity of the opening portion 111 of the external container.

[0021]

As shown in Fig. 5 and Fig. 6, when the volume of the internal container 120 is decreased as the fluid stored in the internal container 120 is discharged, inside the internal space 130 is momentarily depressurized. When inside the internal space 130 is depressurized, the air flows into the internal space 130 from the outside by the action of a runoff prevention mechanism described in detail later. By this action, pressure inside the internal space 130, and outside pressure and pressure inside the internal container 120 are kept constant and facilitating suction of the fluid from the internal container 120 becomes possible.

[0022]

The external container 110 comprises a hard material such as synthetic resin and glass. The internal container 120 comprises a flexible bag body having the opening portion 121. By using this double construction, the internal container 120 changes shape as the volume of the fluid is decreased while maintaining an external shape, enabling to facilitate suction of the fluid.

[0023]

When this fluid storing portion 4 is assembled, as shown in Fig. 7, the first engaging portion 145 of the coupling material 140 is inserted in the opening portion 121 of the internal container; this internal container 120 is inserted inside the external container 110 through the opening portion 111 of the external container; the second engaging portion 146 of the coupling material 140 engaging with the internal container 120 is engaged with the vicinity of the opening portion 111 of the external container. In this way, the internal container 120 and the coupling material 140 are fixed liquidtightly. By this coupling material 140, the internal space 130 leading to the outside only through the through-bore 142 described later is formed between the external container 110 and the internal container 120. Additionally, when the through-bore closing material 143 is placed on top of the coupling material 140 fixed in the opening portion 111 of the external container, the through-bore 142 is closed by this through-bore closing material 143.

[0024]

As shown in Fig. 8, when the fluid is filled inside the fluid storing portion 4, the fluid discharge pump 1, the nozzle head 2 and the outer lid 3 are detached from the fluid storing portion 4, and the through-bore closing material 143 placed on the coupling material 143 is removed. In this way, the air inside the internal space 130 formed between the external container 110 and the internal container 120 can flow outside through the through-bore 142. Consequently, it becomes possible to prevent pressure increase caused by decrease in the volume of the internal space 120 with volume increase in the internal container 120 when the fluid is filled.

[0025]

Fig. 9 is a plan view of the coupling material 140 of the fluid storing portion 4 of the

fluid storing container according to the present invention. Fig. 10 is an A-A cross section of Fig. 9. Fig. 11 is a B-B cross section of the Fig. 9. Fig. 12 is a backside view of the coupling material 140 of the fluid storing portion 4 of the fluid storing container according to the present invention. Fig. 13 (a) is a plan view of the through-bore closing material 143 of the fluid storing portion 4 of the fluid storing container according to the present invention. Fig. 13 (b) is a cross section of the through-bore closing material 143 of the fluid storing portion 4 of the fluid storing container according to the present invention.

[0026]

As shown in Figures 9 to 12, the coupling material 140 is a nearly cylinder-shaped and possesses the first engaging portion 145 which engages with the opening portion 121 of the internal container, the second engaging portion 146 which engages with the opening portion 111 of the external container, and a hollow portion 141 which enables the fluid stored inside the internal container to flow outside via the opening portion 111 of the external container.

[0027]

Additionally, in the coupling material 140, the through-bore 142 passing through the outside and the internal space 120 is formed. This through-bore 142 is closed by placing the through-bore closing material 143 on top of the coupling material 140. With such a construction having the through-bore closing material 143, preventing the fluid from flowing outside from the internal space 120 becomes possible. When the fluid is newly filled in the internal container 120, the through-bore closing material is removed. This makes it possible to prevent pressure increase inside the internal space with volume increase in the internal container 120. Additionally, because this through-bore closing material 143 has a hollow portion 148 leading to the hollow portion 141 of the coupling material, discharging the fluid from the internal container 120 becomes possible.

[0028]

The coupling material 140 further possesses the runoff prevention mechanism. As shown in Fig. 10 and Fig. 11, this runoff prevention mechanism comprises two leakproof portions 144 which are juxtaposed above and below and a groove portion 147

formed on top of the two leakproof portions 144.

[0029]

The leakproof portions 144 have an umbrella shape opening out toward an internal direction of the external container 110; their maximum outer diameter portions contact the opening portion 111 of the external container 110. With this construction, if the fluid attempts to flow out from inside the internal space 130, flowing out of the fluid from the internal space 130 is prevented with the maximum outer diameter portions of the leakproof portions 144 open toward a direction which they contact the inner surface of the opening portion 111 of the external container.

[0030]

Additionally, the leakproof portions 144 have flexibility. Because of this, when pressure is applied to the leakproof portions 144 from the outside due to pressure decrease inside the internal space 130, the leakproof portions 144 close in a direction that their maximum outer diameter portions become small. Consequently, the leakproof portions 144 separate from the inner surface of the opening portion 111 of the external container, enabling the air to pass through from outside to the internal space 130.

[0031]

With the construction described above, when the fluid stored leaks to the internal space 130 due to damage made to the internal container, etc., leaking of the fluid to outside the external container can be prevented. Additionally, the number of the leakproof portions 144 described above is not limited to two; it can be one or two or more.

[0032]

With the coupling material construction described above, when the fluid stored leaks to the internal space 130 due to damage made to the internal container, etc., leaking of the fluid to outside the external container can be prevented because the coupling material possesses the leakproof portions 144. Additionally, because providing the air hole in the external container is not necessary, containers available on the market, e.g. glass bottles, aluminum cans, etc. can be used as the external container 110 without any modification. Any containers capable of housing the internal container 120 can be used.

[0033]

A construction of the fluid discharge pump 1 is described below. Figures 14 to 17 are longitudinal sections showing one embodiment of the fluid discharge pump 1 used for the fluid storing container according to the present invention together with the nozzle head 2. Of these figures, Fig. 14 shows a position in which the fluid discharge pump is left as it is without stress applied. Fig. 15 shows a position in which the first and the second coupling tubes 81 & 82 are descending along with the piston 83 with a pressing portion 12 in the nozzle head 2 being pressed. Fig. 16 shows a position in which both the first and the second coupling tubes 81 & 82 have reached the bottom along with the piston 83. Fig. 17 shows a position in which the first and the second coupling tubes 81 & 82 are ascending along with the piston 83 with pressure applied to the nozzle head 2 removed. Hatching is added only to cross sections of the coupling material 140, the through-bore closing material 143, the first and the second coupling tubes 81 & 82, the cylinder 23 and the fluid in Figures 14 to 17.

[0034]

The fluid discharge pump 1 is set up inside the nearly cylinder-shaped coupling 140. With this construction, while the entire fluid storing container is downsized, the fluid discharge pump 1 can be supported stably.

[0035]

The fluid discharge pump 1 possesses the cylinder 23, the piston 83 which can reciprocate inside the cylinder 23, the first and the second hollow coupling tube 81 & 82 which are coupled and fixed one another and together form a coupling tube for sending down the piston 83 by transmitting pressure applied to the nozzle head 2 to the piston 83 by coupling the nozzle head 2 and the piston 83, a coil spring 24 set up at the periphery of the first and the second coupling tubes 81 & 82 for giving momentum to the piston 83 in an ascending direction, the first valve mechanism for pumping the fluid stored inside the internal container 120 into the cylinder 23 with ascending of the piston 83, the second valve mechanism opening/closing an opening portion 91 for letting the fluid flow into the cylinder 23 out to the nozzle head 2 via inside the first and the second coupling tubes 81 & 82 with descending of the piston 83, and the suction tube 90 which guides the fluid inside the internal container into the cylinder 23.

[0036]

The above-mentioned piston 83 comprises a resin such as silicon rubber, polypropylene and polyethylene. For the coil spring 24, a metal coil spring can be used for obtaining strong momentum.

[0037]

By positioning the tip of the suction tube 90 in the vicinity of the base end surface of the external container 110 and the internal container 120, the fluid leaking into the internal space 130 due to damage made to the internal container 120, etc. can be discharged efficiently.

[0038]

The above-mentioned first valve mechanism is used for closing the opening portion 41 leading to the suction tube 90 engaged with the vicinity of the lower end of the cylinder 23 when inside the cylinder 23 is pressurized, and for opening the opening 41 when inside the cylinder 23 is depressurized.

[0039]

The first valve mechanism possesses a tapered portion 86 which is tapered by the same angle as the tapered inner surface of the lower end portion of the cylinder 23, and a resin valve body 89 having four coupling portions 88 which couple the tapered portion 86 and the supporting portion 87. In the first valve mechanism, as shown in Fig. 15, the opening portion 41 is closed with the tapered portion 86 of the valve body 89 contacting the tapered inner surface of the lower end portion of the cylinder 23 when inside the cylinder 23 is pressurized. When inside the cylinder 23 is depressurized, the opening portion 41 is opened with the tapered portion of the valve body 86 separating from the inner surface of the lower end portion of the cylinder 23 as shown in Fig. 17.

[0040]

The above-mentioned second valve mechanism is used for opening a flow path passing through inside the first and the second coupling tubes 81 & 82 and inside the cylinder 23 by opening the opening portion 91 made below the cylinder-shaped portion of the second coupling tube 82 when the nozzle head 2 is pressed, and for closing the flow path passing through inside the first and the second coupling tubes 81 & 82 and inside

the cylinder 23 by closing the opening portion 91 when pressure applied to the nozzle head 2 is removed.

[0041]

The piston 83 inside the cylinder 23 is set up so as to be able to slide on the second coupling tube 82 between a joined portion with the first coupling tube in the second coupling tube 82 and the lower end portion of the second coupling tube 82. As shown in Figures 4, 5, 15 and 16, in a position in which the top of the piston 23 contacts a portion joined with the first coupling tube 81 in the second coupling tube, a flow path leading to inside the first and the second coupling tubes 81 & 82 from inside the cylinder 23 is formed. As shown in Figures 3, 6, 14 and 17, in a position in which the lower end portion of the piston 83 contacts the lower end portion of the second coupling tube, a flow path leading to inside the first and the second coupling tubes 81 & 82 from inside the cylinder 23 is closed.

[0042]

Fluid discharge motions by the fluid discharge container possessing the above-mentioned fluid discharge pump 1 are described below.

[0043]

In the initial position, as shown in Figures 3 and 14, momentum is given to the first and the second coupling tubes 81 & 82 coupled each other in the upward direction by the action of the coil spring 24, and the lower end portion of the second coupling tube 82 contacts the lower end portion of the piston 83. Consequently, a flow path leading to inside the first and the second coupling tubes 81 & 82 from inside the cylinder 23 is closed. Additionally, by the action of the coupling portion 88 in the valve body 89, the tapered portion 86 of the valve body 89 contacts the tapered inner surface of the lower end portion of the cylinder 23, closing the opening portion 41.

[0044]

In this position, if the pressing portion 12 in the nozzle head 2 is pressed, the first and the second coupling tubes 81 & 82 first descend relatively to the piston 83 as shown in Fig. 4 and Fig. 15. By this motion, the lower end portion of the second coupling tube 82 and the lower end portion of the piston 83 separate. Consequently, a flow path leading

to inside the first and the second coupling tubes 81 & 82 from inside the cylinder 23 via the opening portion 91 is formed.

[0045]

If the pressing portion 12 in the nozzle head 2 is pressed further, inside the cylinder 23 is pressurized as shown in Fig. 5 and Fig. 16. Consequently, the pressurized fluid inside the cylinder 23 flows out to the discharge portion 11 in the nozzle head 2 via the opening portion 91 and the first and the second coupling tubes 81 & 82 which are hollow and is discharged from the discharge portion 11.

[0046]

After the piston 83 descends to the stroke lower end and if pressure applied to the nozzle head 2 is removed, the first and the second coupling tubes 81 & 82 ascend relatively to the piston 83 by the action of the coil spring 24. By this motion, the lower end portion of the second coupling tube 82 contacts the lower end portion of the piston 83. Consequently, a flow path leading to inside the first and the second coupling tubes 81 & 82 from inside the cylinder 23 is closed again.

[0047]

Thereafter, by the action of the coil spring 24, the nozzle head 2 and the first and the second coupling tubes 81 & 82 ascend in one. Because inside the cylinder 23 is depressurized then, the opening portion 41 is opened with the tapered portion 86 of the valve body 89 separating from the tapered inner surface of the lower end portion of the cylinder 23. The fluid flows into the cylinder 23 from the internal container 120 via the suction tube 90. If moving up to the top of the elevating length, the piston 83 stops its ascending motion.

[0048]

By repeating the above-mentioned motions, discharging the fluid stored inside the fluid storing portion 4 becomes possible.

[0049]

With this construction of the fluid discharge pump, back flow of the air from the outside into the internal container 120 can be prevented. Consequently, contacting of the fluid stored with the air can be prevented. Decaying the fluid stored thus can be prevented.

[0050]

The construction of the fluid discharge pump is not limited to the above-mentioned; any construction having a feature capable of discharging the fluid inside the container can be used.

[0051]

The second embodiment of the present invention is described below. Figures 18 to 20 are longitudinal sections showing the second embodiment of the fluid storing container according to the present invention. Of these figures, Fig. 18 shows a position in which the fluid storing container is left as it is without stress applied; Fig. 19 shows a position in which the fluid inside the fluid storing portion 4 is being discharged with the body portion in the fluid storing portion pressed; Fig. 20 shows a position in which pressure applied to the body in the fluid storing portion is removed. Hatching is added only to cross sections of the coupling material 140, the through-bore material 143 and the fluid in Figures 18 to 20.

[0052]

The second embodiment of the fluid storing container according to the present invention differs from the first embodiment in a point that the fluid is discharged by pressing the body portion 112 of the fluid storing portion, whereas the fluid is discharged by pressing the fluid discharge pump 1 in the first embodiment of the fluid storing container according to the present invention. Additionally, if the same materials used in the first embodiment are used in the second embodiment as well, the same symbols are used and detailed descriptions are omitted.

[0053]

This fluid storing container comprises the fluid storing portion 4 having the same features and construction as the first embodiment, a valve mechanism 5 and a discharge material 6.

[0054]

As shown in Fig. 18, the valve mechanism 5 is engaged with the hollow portion 141 of the coupling material 140 in the fluid storing portion 4. Additionally, the discharge material 6 is engaged with a screw portion formed at the top of the fluid storing portion

4 via a screw material. The fluid storing portion 4, the valve mechanism 5 and the discharge material 6 can be detached from each other.

[0055]

In this fluid storing container, when pressure is applied to the fluid stored inside the internal container 120 by pressing the body portion 112 in the fluid storing portion 4, the fluid stored inside the fluid storing portion 4 is discharged from a discharge port 13 in the discharge material 6. When the pressure applied to the body portion 112 in the fluid storing portion 4 is removed, the discharge port 13 is closed by the action of a valve mechanism described in detail later, preventing back flow of the air.

[0056]

As shown in Fig. 19, when the volume of the internal container 120 is decreased with the fluid stored inside the internal container 120 discharged, the internal space 130 is momentarily depressurized and pressure is applied in a direction toward the internal space 130 from the outside. Consequently, in the same manner as in the first embodiment, the air flows into the internal space 130 from the outside by the action of the runoff prevention mechanism. By this mechanism, pressure inside the internal space 130, and outside pressure and pressure inside the internal container 120 are kept constant, and facilitating suction of the fluid from the internal container 120 becomes possible.

[0057]

When the fluid is filled into the fluid storing portion 4, as shown in Fig. 4, by separating the fluid storing portion 4, the valve mechanism 5 and the coupling body 6, and by removing the through-bore closing material 14 placed on the coupling material 143 and the valve mechanism 5, it is possible to let the air inside the internal space 130 formed between the external container 110 and the internal container 120 outside through the through-bore. This prevents pressure increase resulted from decrease in the volume of the internal space as the volume of the internal container 120 increases when the fluid is filled.

[0058]

A construction of the valve mechanism 5 is described below. Fig. 21 and Fig. 22 are

longitudinal sections showing the vicinity of the discharge portion of the fluid storing container in a position in which the valve mechanism used for the fluid storing container according to the present invention is engaged. Of these figures, Fig. 21 shows a position in which the fluid storing container is left as it is without stress applied; Fig. 22 shows a position in which the fluid inside the fluid storing container is being discharged with the body portion 112 in the fluid storing container being pressed. Hatching is added only to cross sections of the coupling material 140 and the through-bore closing material 143 in Fig. 21 and Fig. 22.

[0059]

Fig. 23 (a) is a longitudinal section showing a position in which the opening portion 241 of the valve mechanism 5 used for the fluid storing container according to the present invention is closed. Fig. 23 (b) is a longitudinal section showing a position in which the opening portion 241 of the valve mechanism 5 used for the fluid storing container according to the present invention is opened.

[0060]

This valve mechanism comprises a valve material 220 and a valve seat material 240.

[0061]

The valve material 220 has a valve body 221 having a shape corresponding to the circular opening portion 241 in the valve seat material 240 described later, and a joined portion 222 set up by standing it in the valve body 221.

[0062]

The valve seat material 240 has a circular opening portion 241, an engaging portion 231 engaging with the hollow portion of the coupling material 140, a valve material supporting portion supporting the joined portion 222 of the valve material 220, and four coupling portions 232 coupling the engaging portion 231 and the valve material supporting portion 233. In the valve material supporting portion 233, a hole 238 for inserting/fitting the joined portion 232 in the valve material 220 is formed. By inserting/fitting the joined portion 222 in this hole 238 after passing through the opening portion 241 of the valve seat material 240 described later, the valve material 220 is fixed with the valve seat material 250. Four coupling portions 232 comprise a flexible resin

having a pair of flexions respectively. By the flexibility of this coupling portions 232, the valve body 221 in the valve material 220 is adapted to be movable between a closing position in which the opening portion 241 in the valve seat material 240 is closed and an opening position in which the opening portion 241 in the valve seat material 240 is opened.

[0063]

The opening portion 241 functions as a valve seat of the valve body 221; an inclined plane 245 forming the opening portion 241 has an angle corresponding to an angle of an inclined plane 223 of the valve body 221 in the valve material 220.

[0064]

In the valve mechanism 5 having this construction, when pressure is applied to the fluid inside the internal container 120 by pressing the body portion 112 of the fluid storing portion 4, the valve body 221 in the valve material 120 moves to the opening position in which the opening portion 241 in the valve seat material 240 is opened as shown in Fig. 19 and Fig. 22. By this motion, the fluid passes through the opening portion 241. When the pressure applied to the body portion 112 of the fluid storing portion 4 is removed, the valve body 221 in the valve material 220 moves to the closing position in which the opening portion 241 in the valve seat material 240 is closed by the valve body 221 in the valve material 220 by elastic restoring force of four coupling portions 232 as shown in Fig. 20. By this mechanism, penetration of the air into the internal container 120 from the opening portion 241 can be prevented.

[0065]

With this construction of the valve mechanism, back flow of the air into the internal container 120 from the outside can be prevented. As a result, contacting of the fluid stored with the air can be prevented. Decaying the fluid stored thus can be prevented.

[0066]

The construction of the valve mechanism is not limited to the above-mentioned; any construction having a feature capable of opening the opening portion if the body portion 112 of the fluid storing portion 4 is pressed and closing the opening portion if the pressure applied to the opening portion 112 is removed can be used.

[0067]

[Effects]

According to the invention described in Claims 1 to 3, because the invention possesses the runoff prevention mechanism which prevents flowing out of the fluid from the internal space formed between the external container and the internal container to the outside and which enable flowing in of the air from the outside to the internal space, it is not necessary to provide an air hole in the external container or a part of the lid, and the fluid from leaking outside can be prevented.

[0068]

Additionally, because there is no need for providing an air hole in the external container, it becomes possible to use containers available on the market without any modification.

[0069]

According to the invention described in Claim 2, because the fluid discharge pump is set up inside the nearly cylinder-shaped coupling material, it becomes possible to support the fluid discharge pump stably.

[0070]

According to the invention described in Claim 4, because the valve mechanism is set up inside the nearly cylinder-shaped coupling material, it becomes possible to support the fluid discharge pump stably.

[0071]

According to the invention described in Claim 5, because the through-bore passing through between the outside and the internal space is formed in the coupling material, it becomes possible to prevent pressure increase in the internal space with volume increase of the internal container when the fluid is filled. Additionally, because the invention possesses the through-bore closing material, which closes the through-bore, outside the coupling material, it becomes possible to prevent flowing out of the fluid from the internal space after the fluid is filled.

[0072]

According to the invention described in Claim 6, because the runoff prevention mechanism possesses flexible leakproof portions which have an umbrella shape opening

out toward an internal direction of the external container and whose maximum outer diameter portions contact the opening portion of the external container, while the construction is simple, it becomes possible to prevent leaking of the fluid to the outside even when the fluid leaks into the internal space due to damage to the internal container, etc.

[Brief Description of the Figures]

[Figure 1]

FIG. 1 is a cross section showing the relevant part of the first embodiment of the fluid storing container according to the present invention.

[Figure 2]

FIG. 2 is a cross section showing the exploded view of the relevant part of the first embodiment of the fluid storing container according to the present invention.

[Figure 3]

FIG. 3 is a longitudinal section showing the first embodiment of the fluid storing container according to the present invention.

[Figure 4]

FIG. 4 is a longitudinal section showing the first embodiment of the fluid storing container according to the present invention.

[Figure 5]

FIG. 5 is a longitudinal section showing the first embodiment of the fluid storing container according to the present invention.

[Figure 6]

FIG. 6 is a longitudinal section showing the first embodiment of the fluid storing container according to the present invention.

[Figure 7]

FIG. 7 is a longitudinal section showing the first embodiment of the fluid storing container according to the present invention.

[Figure 8]

FIG. 8 is a longitudinal section showing a position when the fluid is filled in the fluid

storing portion 4 of the fluid storing container according to the present invention.

[Figure 9]

FIG. 9 is a plan view showing the coupling material 140 of the fluid storing portion 4 of the fluid storing container according to the present invention.

[Figure 10]

FIG. 10 is an A-A cross section of Fig. 9.

[Figure 11]

Fig. 11 is a B-B cross section of the Fig. 9.

[Figure 12]

Fig. 12 is a backside view showing the coupling material 140 of the fluid storing portion 4 of the fluid storing container according to the present invention.

[Figure 13]

Fig. 13 (a) is a plan view of the through-bore closing material 143 of the fluid storing portion 4 of the fluid storing container according to the present invention. Fig. 13 (b) is a longitudinal section of the same.

[Figure 14]

Fig. 14 is a longitudinal section showing an embodiment of the fluid discharge pump 1 used for the first embodiment of the fluid storing container according to the present invention together with the nozzle head 2.

[Figure 15]

Fig. 15 is a longitudinal section showing an embodiment of the fluid discharge pump 1 used for the first embodiment of the fluid storing container according to the present invention together with the nozzle head 2.

[Figure 16]

Fig. 16 is a longitudinal section showing an embodiment of the fluid discharge pump 1 used for the first embodiment of the fluid storing container according to the present invention together with the nozzle head 2.

[Figure 17]

Fig. 17 is a longitudinal section showing an embodiment of the fluid discharge pump 1 used for the first embodiment of the fluid storing container according to the present

invention together with the nozzle head 2.

[Figure 18]

Fig. 18 is a longitudinal section showing the second embodiment of the fluid storing container according to the present invention.

[Figure 19]

Fig. 19 is a longitudinal section showing the second embodiment of the fluid storing container according to the present invention.

[Figure 20]

Fig. 20 is a longitudinal section showing the second embodiment of the fluid storing container according to the present invention.

[Figure 21]

Fig. 21 is longitudinal section showing the vicinity of the discharge portion of the fluid storing container in a position in which the valve mechanism 5 used for the fluid storing container according to the present invention is engaged.

[Figure 22]

Fig. 22 is longitudinal section showing the vicinity of the discharge portion of the fluid storing container in a position in which the valve mechanism 5 used for the fluid storing container according to the present invention is engaged.

[Figure 23]

Fig. 23 (a) is a longitudinal section showing a position in which the opening portion 241 of the valve mechanism 5 used for the fluid storing container is closed. Fig. 23 (b) is a longitudinal section showing a position in which the opening portion 241 is opened.

[Explanation of symbols used]

1 Fluid discharge pump
2 Nozzle head
3 Outer lid
4 Fluid storing portion
5 Valve mechanism
6 Discharge material

11	Discharge portion
12	Pressing portion
13	Discharge port
20	Concave portion
23	Cylinder
24	Coil spring
41	Opening portion
81	First coupling tube
82	Second coupling tube
83	Piston
86	Tapered portion
87	Supporting portion
88	Coupling portion
89	Valve body
90	Suction tube
91	Opening portion
110	External container
111	Opening portion
120	Internal container
121	Opening portion
130	Internal space
140	Coupling material
141	Hollow portion
142	Through-bore
143	Through-bore closing material
144	Leakproof portion
145	First engaging portion
146	Second engaging portion
147	Groove portion
148	Hollow portion

220 Valve material
221 Valve body
222 Joined portion
223 Inclined plane
231 Engaging portion
232 Coupling portion
233 Valve material supporting portion
236 Flexion
238 Hole
240 Valve seat material
241 Opening portion

[Document name] Abstract

[Abstract]

[Problems to be solved] The object of the present invention is to provide a fluid storing container which can effectively prevent a stored fluid which leaks into a space formed between the container main body and an internal container from leaking outside the main body.

[Solution] The fluid storing portion 4 possesses an external container 110, an internal container 120 and a coupling material 140 which forms an internal space 130 shielded from the outside between the internal container 120 and the external container 110. When the volume of the internal container 120 is decreased with the fluid stored inside the internal container 120 being discharged, the internal space 130 is depressurized and receives force in a direction toward the internal space 130 from outside. Consequently, the air flows into the internal space 130 from the outside by the action of a runoff prevention mechanism in the coupling material 140, keeping pressure inside the internal space 130, and outside pressure and pressure inside the internal container 120 constant.

[Figure selected] FIG. 6